

ACTIVITY GUIDE AT-A-GLANCE

Take an adventure-filled journey to learn about science!

1. & 2. SCHEDULING OPTIONS

Choose from a grid-style schedule (1) or a list-style schedule (2). Either way, these scheduling options will make planning your weekly science adventure a snap! These schedule sheets include a summary of the chapter in case your students are reading the novel or listening to the audiobook on their own.

READ

3. READING ASSIGNMENTS

Know what to read each week in the corresponding Sassafras Science novel. Plus, get options for additional encyclopedia pages to read and for books to check out from the library. The novel contains the essential information for each week, but if you want to dig deeper, we've got you covered!

WRITE

4. SCIDAT LOGBOOK INFO

Have confidence that your students are grasping the key points from the reading with the information in the notebooking section. Here, you will find the scientific details that were shared in the chapter, which could be included in your students' narrations or list of facts.

5. RELEVANT VOCABULARY

Build your students' science vocabulary with words relevant to the topics the students are studying.

6. COPYWORK

Use these selections as memory work, copywork, or dictation—it's up to you!

CHAPTER 2: GRID SCHEDULE				
Supplies Needed				
Demo	• Modeling clay (you will need yellow, orange, red, blue, and green). Ruler			
Projects	• Rock to identify, Rice Krispies, Marshmallows, Butter, Icing			
Chapter Summary				
<p>The chapter opens with the Man With No Eyebrows recalling his plan to kidnap the villains that the Sasquatch Twins have encountered on their journey so far. We also find out that Tracey found the camera he had hidden in Uncle Gorch's basement lab. Elsewhere, Blaine and Tracey arrive at their first location in Ecuador, where a little girl is fighting over her bike with a bully named Just. Just as Blaine and Tracey are about to step in, two superheros swoop in and save the day. It turns out that one of the encounters is their lead expert, Just Jackson, and he shares about continents and the layers of the earth with the twins. Blaine and Tracey also find out the first clue that the two would be superheros are in Ecuador looking for the Howling Shadow, which is said to have a hidden complex in a nearby volcano. The group heads back to the girl's uncle's duck boat shop where the girl, Alicia, tells her Uncle Arturo the story of what has happened. In the meantime, the Man With No Eyebrows uses the Duck Cape to kidnap Rosa the Baker (she later goes back to his lab, and even her memory). The chapter ends back at the duck boat shop, where Arturo confirms the belief that the Howling Shadow lives in the vicinity of Mt. Cotacachi, a nearby volcano.</p>				
Weekly Schedule				
	Day 1	Day 2	Day 3	Day 4
Read	Read the section entitled "Continents" of Chapter 2 in SSA Volume 5: <i>Geology</i>	Read the section entitled "Continents" of Chapter 2 in SSA Volume 5: <i>Geology</i>	Read one of the assigned pages from the encyclopedia of your choice.	(Optional) Read one of the additional library books.
Write	Fill out a Geology Research Sheet on SL p. 9 on continents.	Fill out a Geology Research Sheet on SL p. 10 on layers of the earth.	Write the information learned from the demonstration on SL p. 13.	Go over the vocabulary words and enter them into the Geology Glossary on SL p. 91.
Do	Add information to Auntie America to the Continents Sheet on SL p. 7.	Label the surrounding bodies of water and/or land for South America to the Continents Sheet on SL p. 8.	(Optional) Write a narration on the Geology News Sheet on SL p. 13.	(Optional) Add to the encyclopedia or dictionary assignment and add it to the Geology News sheet on SL p. 13.
	(Optional) Label the Continents.	(Optional) Make an Edible Earth.	(Do the demonstration entitled "Model Earth.")	(Optional) Add a rock to your Rock Collection.

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THE SASQUATCH GUIDE TO GEOLOGY – CHAPTER 2

CHAPTER 2: LIST SCHEDULE

CHAPTER SUMMARY

The Man With No Eyebrows recalls his plan to kidnap the villains that the Sasquatch Twins have encountered on their journey so far. We also find out that Tracey found the camera he had hidden in Uncle Gorch's basement lab. Elsewhere, Blaine and Tracey arrive at their first location in Ecuador, where a little girl is fighting over her bike with a bully named Just. Just as Blaine and Tracey are about to step in, two superheros swoop in and save the day. It turns out that one of the encounters is their lead expert, Just Jackson, and he shares about continents and the layers of the earth with the twins. Blaine and Tracey also find out the first clue that the two would be superheros are in Ecuador looking for the Howling Shadow, which is said to have a hidden complex in a nearby volcano. The group heads back to the girl's uncle's duck boat shop where the girl, Alicia, tells her Uncle Arturo the story of what has happened. In the meantime, the Man With No Eyebrows uses the Duck Cape to kidnap Rosa the Baker (she later goes back to his lab, and even her memory). The chapter ends back at the duck boat shop, where Arturo confirms the belief that the Howling Shadow lives in the vicinity of Mt. Cotacachi, a nearby volcano.

ESSENTIAL TO-DO'S

Reading "Continents" of Chapter 2 in SSA Volume 5: *Geology*
Filling "Layers" of Chapter 2 in SSA Volume 5: *Geology*

Fill out on SL p. 9 on continents.
Go over the Continents Sheet on SL p. 7.
Fill out on SL p. 10 on layers of the earth.
Fill out water and/or land for South America on the Continent Map on SL p. 13.
Do the demonstration on SL p. 13.
Go over and enter them into the Geology Glossary on SL p. 91.

OPTIONAL EXTRAS

Read one of the additional library books.
Read one of all of the assigned pages from the encyclopedia of your choice.

CHAPTER 2: A SUPER SCIENTIFIC START	
READ: GATHERING INFORMATION	
<p>LIV: <i>Sassafras Science Adventures Volume 5: Geology</i></p> <p>OPTIONAL ENCYCLOPEDIA READINGS</p> <ul style="list-style-type: none"> • <i>Barber Science Planet Earth</i> pp. 10-11 (Core), pp. 12-13 (Monthly), pp. 14-15 (Crust), pp. 40-41 (Continents) • <i>Children's Encyclopedia</i> pp. 290-291 (South America) • <i>Discover Science Planet Earth</i> pp. 8-9 (Inside Earth) • <i>Kingfisher Science Encyclopedia</i> pp. 8-9 (Earth Structure) <p>OPTIONAL ADDITIONAL LIBRARY BOOKS</p> <ul style="list-style-type: none"> • <i>The Seven Continents (Bookie Read-Aloud Geography)</i> by Will Mara • <i>Continents in My World</i> by Ella Cane and Gail Saunders-Smith • <i>Explore South America (Explore the Continents)</i> by Molly Alkian and Bobbie Kalman • <i>Planet Earth/Inside Out</i> by Gail Gibbons • <i>The Magic School Bus Inside the Earth (Magic School Bus)</i> by Joanna Cole and Bruce Degen • <i>See Inside Planet Earth (Ultimate Play Book)</i> by Katie Daynes and Peter Allen 	
WRITE: KEEPING A NOTEBOOK	
<p>SCIDAT LOGBOOK SHEETS</p> <p>This week, you can have the students fill out the continent map for South America from the chapter. They can also fill out the sheets for continents and layers of the earth with the information they could include.</p> <p>Continent Map - South America</p> <p>This week, have the students label the bordering bodies of water and land on the continent map. The students should label the following:</p> <ul style="list-style-type: none"> • Isthmus of Panama • Pacific Ocean • Atlantic Ocean • Caribbean Sea • Drake Passage 	

CHAPTER 2: A SUPER SCIENTIFIC START	
WRITE: KEEPING A NOTEBOOK	
<p>SCIDAT LOGBOOK SHEETS</p> <p>This week, you can have the students fill out the continent map for South America from the chapter. They can also fill out the sheets for continents and layers of the earth with the information they could include.</p> <p>Continent Map - South America</p> <p>This week, have the students label the bordering bodies of water and land on the continent map. The students should label the following:</p> <ul style="list-style-type: none"> • Isthmus of Panama • Pacific Ocean • Atlantic Ocean • Caribbean Sea • Drake Passage 	
DO: PLAYING WITH SCIENCE	
<p>SOIL CONCENTRATION: MODEL EARTH</p> <p>Materials</p> <ul style="list-style-type: none"> • Modeling clay (you will need yellow, orange, red, blue, and green). • Ruler <p>Procedure</p> <ol style="list-style-type: none"> 1. Have the students begin by making a ball about 1.2 cm across out of the modeling clay. 2. Then, have them make another layer about 1 cm across out of the modeling clay. 3. After that, have them add another layer about 1 cm across out of the modeling clay. 4. Next, have the students make several flattened pieces of blue and green clay. 5. Finally, have the students cut the ball in half to observe the different layers of their model. <p>Explanation</p> <p>The students should see the different layers in their model just as if we were to cut the earth in half to peek inside!</p> <p>Take It Further</p> <p>Have the students make a paper mache model of the earth. Directions for this can be found here:</p> <p>→ https://www.middleschoolscience.com/step-by-step-making-paper-mache-earth/</p>	

ACTIVITY GUIDE AT-A-GLANCE

DO

7. RELATED SCIENTIFIC DEMONSTRATIONS

Know what materials you will need to do a weekly hands-on science activity that coordinates with the topic. This section lists the supplies you will need, provides easy-to-follow steps, and explanations to make it a snap to complete the scientific demonstration.

8. COORDINATING STEAM* ACTIVITIES

Add in a bit of STEAM with these Optional activity ideas. You will find ideas for projects that last throughout the novel and ones specific to the chapter (week) you are on.

9. TEMPLATES AND MORE

In the guide's appendix, you will find templates for the projects, a full glossary, and a set of quizzes to use along the journey.

*STEAM: Science, Technology, Engineering, Art, and Math

THE SCIDAT* LOGBOOK

Don't forget the SCIDAT logbook for your students!!

The SCIDAT logbook will serve as a record of your students' journey! It contains all the pages the students will need as they follow like Blaine and Tracey. Each page has been attractively illustrated for you so you don't have to track down pictures for the students to use! Get it all at:

<https://elementalscience.com/collections/sassafras-science>



*SCIDAT: Scientific Data

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THE SASSAFRAS GUIDE TO GEOLOGY

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QUICK START GUIDE

Welcome to your super, scientific journey with the Sassafras Twins!! The information and activities in this guide will help you turn a simple adventure novel into a complete science program for your elementary students. Let's start by answering three pressing questions!

WHAT WILL WE LEARN?

Students will learn about earth science, which is the study of rocks. See p. 11 for a list of the topics explored in this program.

WHAT DO I NEED?

In addition to this activity guide, you will need the following materials

1. **Novel** – *The Sassafras Science Adventures Volume 5: Geology* - All the main reading assignments are from this book. You can get the paperback novel, the Kindle version, or the audiobook.
2. **Student Materials** – You can have your students use a blank notebook or you can purchase a copy of *The Official Sassafras SCIDAT Logbook: Geology Edition* for each student. Get a glimpse of this option on p. 7. (SCIDAT stands for scientific data and it comes from the Sassafras Twins' journey.)
3. **Demonstration Supplies** – See p. 12 for a full list, or save yourself time and get the *Sassafras Science Year 3 Experiment Kit*, which includes the materials for both volume 5 and volume 6.

If you want more information than what is already in the novel, the following encyclopedias are scheduled in this guide:

- 🔍 *Basher Science Planet Earth* and *Basher Science Rocks and Minerals* (best for 1st through 2nd grades)
- 🔍 *Usborne Children's Encyclopedia* (best for 2nd through 4th grades)
- 🔍 *Discover Science Planet Earth* and *Discover Science Rocks and Fossils* (best for 2nd through 4th grades)
- 🔍 *Kingfisher Science Encyclopedia* (best for grades 4th through 6th grades)

If you want to add more fun with optional STEAM* projects, you can find a list of the project supplies on p. 13.

*STEAM: Science, Technology, Engineering, Art, and Math

WHAT WILL A WEEK LOOK LIKE?

Each week you and your students will engage in the following activities:

- 🔍 **Read** scientific information from an adventure-filled novel, also known as a living book, and discuss what you read.
- 🔍 **Write** down what the students have learned and seen in a way that is appropriate for their skills by keeping a notebook, or rather a SCIDAT Logbook.
- 🔍 **Do** hands-on science through demonstrations using the directions found in this guide.

You can also add in the optional copywork, library books, and STEAM activities if you want to dig deeper into a topic. For a more detailed explanation of the components in each lesson, we highly recommend checking out the peek inside this guide on pp. 6-7 and reading the introduction on pp. 8-10. The chapter lessons begin on p. 19.



THE SASSAFRAS GUIDE TO GEOLOGY

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THE SASSAFRAS GUIDE TO GEOLOGY

INTRODUCTION

Our living books method of science instruction was first proposed in *Success in Science: A Manual for Excellence in Science Education*. This approach is centered on living books that are augmented by notebooking and scientific demonstrations. The students read (or are read to) from a science-oriented living book, such as *The Sassafras Science Adventures Volume 5: Geology*. Then, they write about what they have learned and complete a related scientific demonstration or hands-on project. If time and interest allow, the teacher can add in non-fiction books that coordinate with the topic, do an additional activity, or memorize related information. If you want to learn more about how this works, you can listen to this free conference session on using living books for science:

🔊 Inspiring your students to love science through living books: <https://youtu.be/Dvk1LfYGONw>

The books in *The Sassafras Science Adventures* series are designed to give you the tools you need to employ the living books method of science instruction with your elementary students. For this reason, we have written an activity guide and a logbook that corresponds to each novel. This particular activity guide contains 18 chapters of activities, reading assignments, scientific demonstrations, and so much more for studying geology.

Each of the chapters in this guide corresponds directly to the chapters in *The Sassafras Science Adventures Volume 5: Geology*. They were written to give you the information you need to turn the adventure novel into a full science course for your elementary students. They will provide you with a buffet of options you can use to teach the students about rocks. So pick and choose what you know you and your students will enjoy!

WHAT EACH CHAPTER CONTAINS

Each chapter begins with your two scheduling options—a grid schedule and a list schedule. These contain a summary of the corresponding chapter in *The Sassafras Science Adventures Volume 5: Geology* and the same weekly assignments, but in a different format. These schedules are included to give you an idea of how your week could be organized, so please feel free to alter them to suit your needs. Following the scheduling options, you will find the details for reading, writing, and doing science for the particular chapter. This information is divided into the following sections:


READ: GATHERING INFORMATION

① **LIVING BOOK READING ASSIGNMENT** – This section contains a paragraph summary of the corresponding chapter in *The Sassafras Science Adventures Volume 5: Geology*.

🔍 **(OPTIONAL) ENCYCLOPEDIA READINGS** – This section contains possible reading assignments from:

- 📖 *Basher Science Planet Earth* (best for 1st through 2nd grades)
- 📖 *Basher Science Rocks and Minerals* (best for 1st through 2nd grades)
- 📖 *Usborne Children's Encyclopedia* (best for 2nd through 4th grades)
- 📖 *Discover Science Planet Earth* (best for 2nd through 4th grades)
- 📖 *Discover Science Rocks and Fossils* (best for 2nd through 4th grades)
- 📖 *Kingfisher Science Encyclopedia* (best for grades 4th through 6th grades)


You can choose to read the assignments to the students or have the students read them on their own.


 (OPTIONAL) ADDITIONAL LIBRARY BOOKS – This section contains a list of books that coordinate with what is being studied in the chapter. You can check these books out of your local library.

WRITE: KEEPING A NOTEBOOK

- **SCIDAT LOGBOOK INFORMATION** – This section has the information that the students could have included in their SCIDAT logbooks. (SCIDAT stands for scientific data and it comes from the Sassafras Twins' journey.) The students may or may not have the same information on their notebooking sheets, which is fine. You want their SCIDAT logbooks to be a record of what they have learned. The logbook information is included as a guide for you to use as you check their work. For more information about notebooking, please read the following article:

 What is notebooking? – <https://elementalscience.com/blogs/news/what-is-notebooking>


 How to use notebooking with different ages – <https://elementalscience.com/blogs/news/notebooking-with-different-ages>

-  **VOCABULARY** – This section includes vocabulary words that coordinate with each chapter. If the students are older, we recommend that you have them create a glossary of terms using a blank sheet of lined paper or the glossary sheets provided in *The Official Sassafras Student SCIDAT Logbook: Geology Edition*. You can also have them memorize these words and their definitions.

(Optional) Copywork – This section contains a short copywork passage and a longer dictation passage for you to use. Some students may use the shorter passages for dictation or the longer passages for copywork. Feel free to tailor the selections to your students' abilities. You can also use the selections as memory work assignments for the students.

(Optional) Quiz – This section contains the answers for the quizzes included in the appendix. These simple, short quizzes are Optional. You can use them as graded quizzes or as review sheets.

DO: PLAYING WITH SCIENCE

- ☒ **SCIENTIFIC DEMONSTRATION** – This section includes a list of materials, the instructions, and an explanation for a scientific demonstration that coordinates with the chapter. There is a blank lab report sheet provided for you in the appendix on pp. 129-130 if you would like the students to do a write-up of the demonstration. If the students are in grade 4 or higher, we recommend that they complete at least one of these activities for this course.
-  **(OPTIONAL) STEAM* PROJECTS** – These sections contain additional STEAM projects and activities that correspond to the topics in the chapter. There are multi-chapter activities that students can do over the course of several chapters or over the full novel. Plus, there are activities that coordinate with each specific chapter. Pick and choose the activities that interest you and your students.

*STEAM: Science, Technology, Engineering, Art, and Math

ADDITIONAL MATERIALS

We have provided a few additional materials in the back of this guide for your convenience. First, you will find the templates you need for the projects suggested in this guide. Next, you will find a glossary of terms,

which you can use with the students as they define the words for each chapter. And finally, you will find a set of eight simple quizzes you can use with the students to verify they are retaining the material.

QUICK LINKS

View all the links mentioned in this guide in one place and get a digital copy of the templates, glossary, and quizzes by visiting the following page:

🔗 <https://elementalscience.com/blogs/resources/volume-5-links>

FOR THE STUDENTS

The SCIDAT logbook is meant to be a record of the students' journey through their study of geology. It is explained in more detail in Chapter 1 of this guide. You can choose to make your own or purchase a premade logbook from Elemental Science. *The Official Sassafras SCIDAT Logbook: Geology Edition* has all the pages the students will need to create their own logbook. Each page has been attractively illustrated for you so you don't have to track down pictures for the students to use. This way they can focus on the information they are learning.

FINAL THOUGHTS

As the author and publisher of this curriculum I encourage you to contact me with any questions or problems that you might have concerning *The Sassafras Guide to Geology* at support@elementalscience.com. I, or a member of our team, will be more than happy to assist you. I hope that you and your students enjoy your journey through geology with the Sassafras twins!

~ Paige Hudson

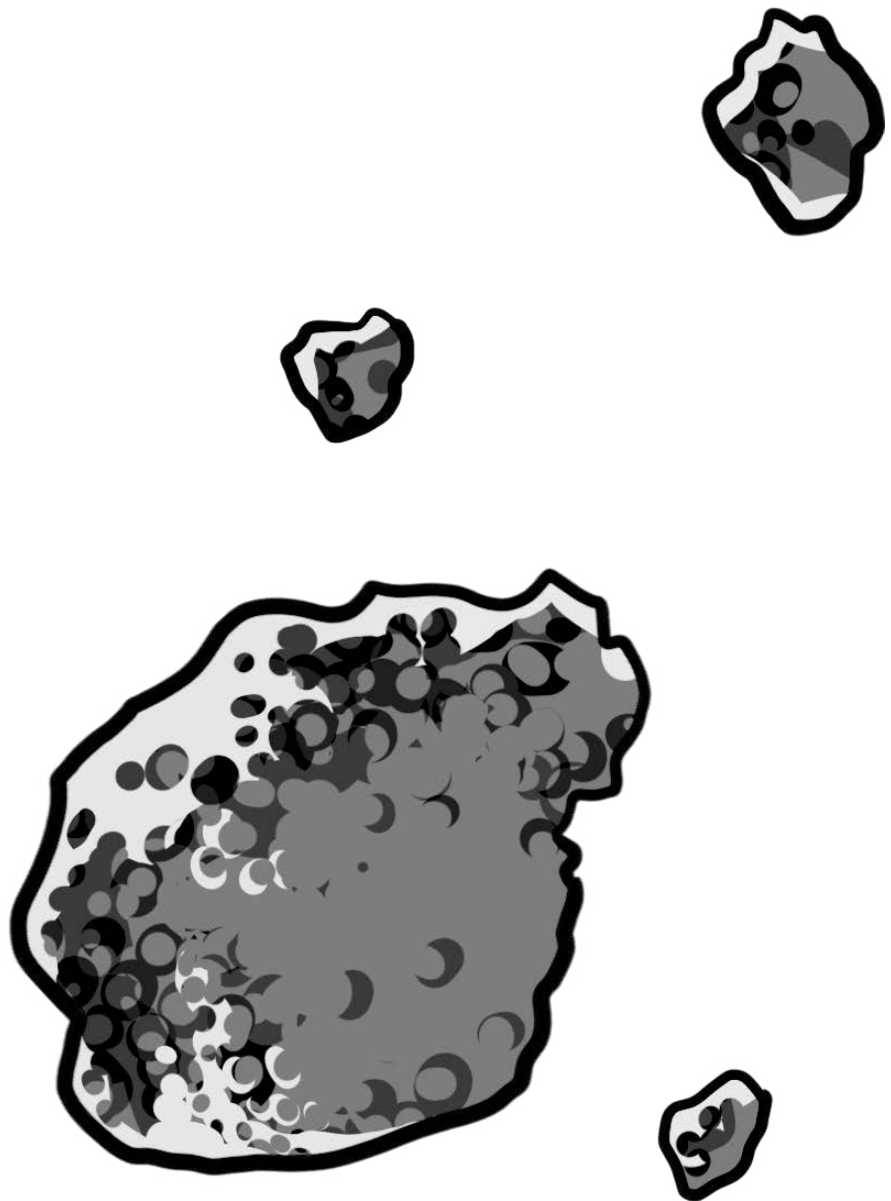
TOPICAL LIST

The Sassafras Science Adventures Volume 5: Geology covers a variety of aspects of geology, such as:

- Types of Rocks (Igneous, Metamorphic, and Sedimentary)
- Earth's Geographic Features
- Continents
- Basic Mapping Skills

In the process, you will learn about the following specific topics:

- Layers of the Earth
- Volcanoes
- Geysers
- Basalt
- Pumice
- Fjords
- Glaciers
- Meteors
- Gneiss
- Maps
- Latitude
- Longitude
- Erosion
- Plate Tectonics
- Earthquakes
- Beryl
- Tsunamis
- Diamonds
- Caves
- Stalagmites
- Stalactites
- Soil
- Clay
- Sandstone
- Islands
- Fossils
- Amber
- Fossil Fuels
- Mountains



DEMONSTRATION SUPPLIES LISTED BY CHAPTER

CHAPTER	SUPPLIES NEEDED
1: Observing the Backyard	No supplies needed
2: Model Earth	Modeling clay (you will need yellow, orange, red, blue, and green) , Ruler
3: Volcanic Explosion	Aluminum pan, Empty soda bottle with a small opening, Air-dry clay or salt dough, Baking soda, Liquid dish soap, Red and yellow food coloring, White vinegar
4: Molten Rock	Several different colors of crayon, An old pot, Wax paper (2 sheets), Straw
5: Floating Rocks	Clear jar, Water, Small piece of pumice
6: Glacial Movement	Can of sweetened condensed milk, Cornstarch, Cereal box, Chocolate chips or nuts, Icing
7: Changing Rocks	Six different colors of crayon, Old grater, Aluminum foil, Bowl, Hot water
8: Flat or Round	Blue balloon (with the continents drawn or printed on it), Flat map, Pin
9: Sandy Changes	Sandpaper, Bar of soap, Plate
10: Tectonic Movement	Marshmallow creme (or whipping cream), Graham cracker, Plate, Bowl with about an inch of water
11: Faux Emeralds	Small Rock, Jar with lid, Bowl, Water, Borax, Green food coloring, Sandpaper (Optional)
12: Rocky Layers	Several different colors of crayons, Old grater, Butter knife, Crayon or pencil sharpener, Aluminum foil
13: Dripstone	2 Cups, Warm water, Yarn (1 and a half feet in length), Baking soda, 2 Washers, Paper clip, Paper towel
14: Soil Observations	Soil from your backyard, Magnifying glass, Small trowel, Bowl
15: Dissolving Rock	Jar, Piece of limestone, White vinegar
16: Ferny Impressions	Air dry clay, Fern frond, Rolling pin
17: Mountain Model	Cardboard, Air-dry clay or salt dough, Paint (white, grey, green, and blue)
18: Rock Slides and Arrows	Rock Slids and Arrows Cards and Gameboard (Download these for free from Elemental Science.)

STEAM PROJECT SUPPLIES LISTED BY CHAPTER

The multi-chapter and specific chapter STEAM projects listed in this guide are optional, so you may not need all of these supplies. However, this list has been provided for your convenience. If you do decide to do these projects, in addition to the items listed each week you will need glue, scissors, a variety of paint colors, and a set of markers.

CHAPTER	SUPPLIES NEEDED
1	No additional supplies needed
2	Rice Krispies, Marshmallows, Butter, Icing
3	Paper cup, Crackers (saltines or Ritz™), Can of CheeseWhiz™
4	Small piece of basalt, Microscope collection dish
5	Whipping cream, Powdered sugar, Bowl, Beater, Cup, Water, Small piece of pumice, Microscope collection dish, Slide
6	Small ball, Pan, Flour, Cocoa powder
7	Small piece of gneiss, Microscope collection dish
8	Salt dough (salt, flour, water), Map of your home state or country, Paints (Optional), Large piece of cardboard
9	Salt dough maps from previous week, Paints, Markers
10	Aluminum pan, Sand, Small play houses and people
11	Piece of beryl (emerald or aquamarine), Microscope collection dish, Water bottle, Water, Oil, Blue food coloring, Tape
12	Piece of diamond, Microscope collection dish, Empty butter or yogurt container, Glue, Sand, Small pebbles, Gloves
13	No additional supplies needed
14	Cup, Chocolate bar, Chocolate pudding, Chocolate cookies, Lump of clay
15	Piece of sandstone, Microscope collection dish, Salt dough, Paints
16	Wax, Sponge, Heat source
17	2 Feathers, Vegetable oil, Water, Dish soap
18	Poster board, Marker, Pictures of rocks studied

MICROSCOPE INFORMATION

In this activity guide, I have suggested several microscope activities. These are optional, and they are best utilized with older students. For the microscope work, I have done my best to include links to view the subjects online, whenever possible, so that purchasing a microscope is not absolutely necessary for this course. However, I have shared the information below, about purchasing and using a microscope, for your convenience.

MICROSCOPE INFORMATION

If you do not already own a microscope and you have the funds to get one, I suggest purchasing one for this course. You can purchase a good quality microscope at:

- Lab Essentials, Inc. (www.labessentials.com);
- Children's Microscopes (www.childrensmicroscopes.com/022a000m.html);
- Home School Science Tools (www.hometrainingtools.com).

When purchasing a microscope, you are looking for the following things:

- ☑ A compound monocular microscope;
- ☑ A microscope with 4x, 10x, and 40x objective lenses at a minimum (NOTE—The eyepiece should also give 10x magnification, which then will allow you to look at an object at 40x, 100x, and 400x magnification.);
- ☑ A microscope with separate coarse and fine adjustment knobs;
- ☑ A good light source. (NOTE—The best light source is a LED or fluorescent bulb. Do not get one with mirror illumination.)

If you don't know how to use a microscope, see this website for directions:

🔗 <http://www.microscope-microscope.org/basic/how-to-use-a-microscope.htm>

For most of the microscope assignments in this guide, you will be viewing rocks. The best way to do this is by using a collection dish. Check out the following post for more tips on viewing rocks under the microscope at home:

🔗 <https://elementalscience.com/blogs/science-activities/viewing-rocks-under-a-microscope-at-home>

And if you are not sure how to make a microscope slide, the following post will walk you through the process:

🔗 <https://elementalscience.com/blogs/science-activities/how-to-make-a-microscope-slide>

A PALM-SIZED OPTION

Many of the microscope assignments in this guide could also been done with a palm-sized microscope. You won't see quite as much as you can with a full-sized microscope, but this a much less expensive option! Here's a look at what a palm-sized microscope can do:

🔗 <https://elementalscience.com/blogs/news/palm-sized-microscope-review>

If you are not sure which option will work for you, check out the following article for a comparison of the options:

🔗 <https://elementalscience.com/blogs/news/which-type-of-microscope-for-homeschool>

THE SASSAFRAS GUIDE TO THE CHARACTERS FOUND IN VOLUME 5: GEOLOGY

THROUGHOUT THE BOOK*

- ★ **Blaine Sassafras** – The male Sassafras twin, also known as Train by his uncle and Rowboat by a group of southwest truckers.
- ★ **Tracey Sassafras** – The female Sassafras twin, also known as Blaisey by her uncle and Fish Hook by a group of southwest truckers.
- ★ **Uncle Cecil** – The Sassafras twins' talented, eccentric, and messy uncle. He is an inventor and lead vocalist for the Floating Tomatoes.
- ★ **President Lincoln** – Uncle Cecil's lab assistant, who doesn't say much, but without his talent for inventing, these zip-line traveling adventures wouldn't be possible.
- ★ **The Man With No Eyebrows** – The memory-erasing, disappearing cape-wearing, eyebrowless man who has tried just about everything he can think of to stop the twins.
- ★ **Summer Beach** – The sandwich-loving, excitable scientist and dear friend of Uncle Cecil that the twins have come to love over their journey.

(*Note—These characters also appeared in the first four volumes of *The Sassafras Science Adventures* series.)

CECIL'S NEIGHBORHOOD (CHAPTER 1)

- ★ **Mrs. Pascapali** (paz-kah-pah-LEE) – Uncle Cecil's neighbor who hosted Summer during her memory-loss episode.
- ★ **Preston** – The squeaky teenage clerk at the Left-handed Turtle Market and the official birthday boy.

ECUADOR (CHAPTERS 2-3)

- ★ **Jase Judson** – The twins' local expert in Ecuador, also known as Brick Kid. He is originally from Australia.
- ★ **Andy Judson** – Jase's older brother, also known as Wombatman.
- ★ **Alicia** – A niece of Arturo Azevedos and proud owner of a shiny pink bicycle.
- ★ **Arturo Azevedos** (a-zuh-VEE-dos) – Alicia's uncle who owns and operates a duck boat shop.
- ★ **José** – A local bike-stealing bully.
- ★ **Andrés and Leoncio** (LEE-ohn-see-oh) – José's cousins.
- ★ **Rona the Baker** – She is a thief that the twins ran into during their time at Dockerty castle on their botany leg.

NORWAY (CHAPTERS 4-5)

- ★ **Kami Kimi Waffontaine** – The twin's local expert for their time in Norway. It turns out that this is not one person, but rather a set of twin girls.
- ★ **Vick Waffontaine** – Kami's and Kimi's father.
- ★ **Valerie Waffontaine** – Kami's and Kimi's mother.
- ★ **Mr. Baardson** (BAR-sun) – The rock yard foreman.
- ★ **Chairman Svendsen** (SVEN-sun) – The city council chairman of the town of Geiranger.
- ★ **Mrs. Landvik** (LAN-veek) – The innkeeper at the quaint two-story cottage known as the Ringer House Inn.
- ★ **Tank and Billy** – The two pranksters who livened up the twin's time at Smitty Farms during their zoology leg.

ANTARCTICA (CHAPTERS 6-7)

- ★ **Isaac Revvington** – The twin’s local expert in Antarctica. He is also attempting to complete the Three Pole Challenge.
- ★ **Nyles** – Isaac’s golden retriever.
- ★ **Bill Slaymaker** – A veteran visitor to Antarctica who has spent four winter-overs on the ice.
- ★ **Bobby Spears and Beau Burnett** – The two pilots flying the plane to Antarctica.
- ★ **Hawk Talons** – The professional survivalist that the twins first met in earth science.
- ★ **Itsy** – Dr. Veeginburger’s henchman that the twins met during their anatomy leg.

DEATH VALLEY (CHAPTERS 8-9)

- ★ **J. P. (Catfish) Carlstan** – The twin’s local expert in Death Valley. He is a truck driver who goes by the handle, Catfish, and knows most of the roads in the area.
- ★ **Sally** – The red-headed clerk at Ringo Quick’s.
- ★ **Roly Mackerel** – Catfish’s younger brother who has disappeared in search of the Vanishing Road.
- ★ **Lil’ Goldfish** – Roly’s son and Catfish’s nephew who is along for the ride.
- ★ **Blue Beard, Pearly Pony, and Lion’s Roar** – Catfish’s truck driving friends.
- ★ **Rama** – The pirate king that the twins first encountered during their botany leg.

SRI LANKA (CHAPTERS 10-11)

- ★ **Emeraldine Hendrix** – The twin’s local expert in Sri Lanka who also goes by Emmy and Dean. She is an admired surfer and a knowledgeable scientist.
- ★ **Daryl and Devon** – Emeraldine’s surfing friends who are in search of the legendary Sri Lankan wave.
- ★ **Captain Tharanga** (THAH-ran-gah) – The self-proclaimed “most-feared” captain of the Tectonic Fate.
- ★ **Dr. Pete Pavan** (PAH-vahn) – The man who invited Emeraldine to the island.
- ★ **Kingman Narwarak** (NAH-wah-rr-k) – The Thai kidnapper who was brought to justice during the twin’s anatomy leg.

AUSTRALIA (CHAPTERS 12-13)

- ★ **Jack R. Wagon** – The twin’s local expert in Australia also known as Jackie Ray. He is a former roughneck turned ping-pong playing geologist in search of a diamond.
- ★ **Matty Mingo** – One of the Brown Mountain Hermits that Blaine met during their zoology leg. He owns the Mingo Family Mines.
- ★ **Peggy Jo** – The ping-pong champion that Jack once embarrassingly injured.
- ★ **Stanly Pelter III** – The former schoolmate of Jack and Peggy Jo who owns the S.P.III mining company.
- ★ **Itja** (EET-jah) – The scoundrel leader of a group of bandits known as the Kekeway that the twins encountered on their zoology and anatomy legs.



MADAGASCAR (CHAPTERS 14-15)

- ★ **Elias Zafy** – The twin's local expert while they are in Madagascar. He is not the most talkative fellow, but he sure knows his geology.
- ★ **Miora Zafy** – Elias's older sister.
- ★ **Yuroslav Bogdanovich** – The evil, rogue scientist that the twins have dealt with during their botany and earth science legs.

ALBERTA (CHAPTERS 16-17)

- ★ **Margo Blue** – The twin's local expert in Alberta. She is a paleontologist and part of the BluesTeam in the T-Rex Intrepid Challenge.
- ★ **Clark Blue** – Margo's husband who is also part of the Blue Team in the T-Rex Intrepid Challenge.
- ★ **Apex** – The captain of the Sparkle Ultra Team in the T-Rex Intrepid Challenge.
- ★ **Zenith, Elite, and Pinnacle** – The other members of the Sparkle Ultra Team in the T-Rex Intrepid Challenge.
- ★ **Farley, Milton, Elvis, and Stacks** – The four members of the BAMA Boys Team the T-Rex Intrepid Challenge.
- ★ **Brooks Hirebro** – Head of "Hirebro" – an adventure sports company that sponsors the T-Rex Intrepid Challenge. He is also the head of Team Adventure Fuel.
- ★ **Tim, Abe, and Josh** – The other members of the Adventure Fuel team. They are also Brooks Hirebro's brothers.

SIBERIA (CHAPTER 18)

- ★ **Adrianna Archer** – The former Triple S agent that the twins met during their earth science leg.

CHAPTER LESSONS

CHAPTER 1: GRID SCHEDULE

Supplies Needed				
Demo	• No Supplies Needed			
Projects	• No Additional Supplies Needed			
Chapter Summary				
<p>The chapter opens with the twins nervous to meet Summer for the first time . . . again. Blaine and Tracey recall the events of the last few weeks that led up to the moment. We find out that although Summer’s memories were erased, Uncle Cecil was able to restore them with a canister that contained her memories up to the beginning of summer, meaning that Summer had not yet met the twins. The meeting goes well, and President Lincoln presents his review of earth science for the twins before the group heads out to the Floating Tomatoes concert. Early the next day, the twins get a new compass application for their phones before they set out on their geology leg. As they are zipping away, Tracey remembers something that she discovered as they were looking for Summer’s memory canister. The chapter ends with Tracey attempting to warn Uncle Cecil, but she leaves before she can get the words completely out.</p>				
Weekly Schedule				
	Day 1	Day 2	Day 3	Day 4
Read	<input type="checkbox"/> Read the section entitled “Meeting for the first time . . . again” of Chapter 1 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> (<i>Optional</i>) Read one or all of the assigned pages from the encyclopedia of your choice.	<input type="checkbox"/> Read the section entitled “On to Geology” of Chapter 1 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> (<i>Optional</i>) Read one of the additional library books.
Write	<input type="checkbox"/> Set up the students’ SCIDAT logbooks.	<input type="checkbox"/> Write observations learned from the demonstration on SL p. 5. <input type="checkbox"/> (<i>Optional</i>) Write a narration on the Geology Notes Sheet on SL p. 6.	<input type="checkbox"/> Go over the vocabulary word and enter it into the Geology Glossary on SL** p. 91.	<input type="checkbox"/> (<i>Optional</i>) Complete the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 6.
Do		<input type="checkbox"/> Do the demonstration entitled “Observing Your Backyard.”	<input type="checkbox"/> (<i>Optional</i>) Make a Compass.	<input type="checkbox"/> (<i>Optional</i>) Play a game of “I Spy.”

*SSA = *The Sassafras Science Adventures*

**SL = *The Official Sassafras SCIDAT Logbook: Geology Edition*

CHAPTER 1: LIST SCHEDULE

CHAPTER SUMMARY

The chapter opens with the twins nervous to meet Summer for the first time . . . again. Blaine and Tracey recall the events of the last few weeks that led up to the moment. We find out that although Summer's memories were erased, Uncle Cecil was able to restore them with a canister that contained her memories up to the beginning of summer, meaning that Summer had not yet met the twins. The meeting goes well, and President Lincoln presents his review of earth science for the twins before the group heads out to the Floating Tomatoes concert. Early the next day, the twins get a new compass application for their phones before they set out on their geology leg. As they are zipping away, Tracey remembers something that she discovered as they were looking for Summer's memory canister. The chapter ends with Tracey attempting to warn Uncle Cecil, but she leaves before she can get the words completely out.

ESSENTIAL TO-DO'S

Read

- ☐ Read the section entitled "Meeting for the first time . . . again" of Chapter 1 in *SSA Volume 5: Geology*.
- ☐ Read the section entitled "On to Geology" of Chapter 1 in *SSA Volume 5: Geology*.

Write

- ☐ Set up the students' SCIDAT logbooks.
- ☐ Go over the vocabulary word and enter it into the Geology Glossary on SL** p. 91.
- ☐ Write observations learned from the demonstration on SL p. 5.

Do

- ☐ Do the demonstration entitled "Observing Your Backyard."

OPTIONAL EXTRAS

Read

- ☐ Read one of the additional library books.

Write

- ☐ Write a narration on the Geology Notes Sheet on SL p. 6.
- ☐ Complete the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 6.

Do

- ☐ Make a Compass.
- ☐ Play a game of "I Spy."

*SSA = *The Sassafras Science Adventures*

**SL = *The Official Sassafras SCIDAT Logbook: Geology Edition*

Supplies Needed	
Demo	• No Supplies Needed
Projects	• No Additional Supplies Needed

CHAPTER 1: THE RETURN OF SUMMER

READ: GATHERING INFORMATION

LIVING BOOK SPINE

- 📖 Chapter 1 of *The Sassafras Science Adventures Volume 5: Geology*

(OPTIONAL) ENCYCLOPEDIA READINGS

There are no Optional encyclopedia readings this week, but you may want to consider purchasing one of the following Rock Field Guides to use for the remainder of your geology studies.

- 📖 *National Audubon Society Field Guide to Rocks and Minerals: North America*
- 📖 *A Field Guide to Rocks and Minerals (Peterson Field Guide)* by Frederick H. Pough and Roger Tory Peterson
- 📖 *National Geographic Pocket Guide to Rocks and Minerals of North America* by Sarah Garlick



(OPTIONAL) ADDITIONAL LIBRARY BOOKS

- 📖 *Let's Go Rock Collecting* (Let's Read-And-Find-Out Science) by Roma Gans and Holly Keller
- 📖 *Compass* (First Step Nonfiction) by Sheila Rivera
- 📖 *Become an Explorer: Make and Use a Compass* (Adventure Guides) by Dana Meachen Rau

WRITE: KEEPING A NOTEBOOK

SCIDAT LOGBOOK SHEETS

This week, you will set up the students' SCIDAT logbook. You can use blank sheets of copy paper with dividers for each section or purchase *The Official Sassafras SCIDAT Logbook: Geology Edition* with all the pictures from Elemental Science. For each of these sheets you can have the students enter information only from *The Sassafras Science Adventures Volume 5: Geology*, or you can have them do additional research to gather more facts. The following video shares a peek inside a 2nd-grader's SCIDAT Logbook:

📺 <https://www.youtube.com/watch?v=0m4nj-K7s58>

What you choose to do will depend upon the ages and abilities of your students. Below is an explanation of each of the student sheets.

Continent Sheets

The purpose of these sheets is to give the students an opportunity to work on their geography skills as they study the seven continents.

MAP: Have the students color and label the continent on the map.

SIZE AND LOCATION: Have the students add how the size of the continent relates to the other

continents, along with the hemisphere the continent can be found.

REGIONS: Have the students enter the the different regions that can be found on the continent.

GEOLOGICAL FEATURES: Have the students enter the major geological features, i.e., mountain ranges, rivers, and so on, that can be found on the continent.

Continent Map Sheets

The purpose of these sheets is to give the students an opportunity to work on their mapping skills. You can have them label the map with the bodies of water or land that border the continent, as well as the major rivers. You can also have them draw in any mountain ranges found on the continent and mark where the major geological features are. We have provided these answers for you in subsequent chapters, or you can have the students look the answers up in a world atlas.

Geology Record Sheets

The purpose of these sheets is for the students to record what they have learned about the various topics that are introduced in *The Sassafras Science Adventures Volume 5: Geology*.

INFORMATION LEARNED: The students should color the picture above the box, if they desire, and enter any information that they have learned about the particular topic.

Geology Science Notes Sheets

The purpose of these sheets is for the students to record any additional information that they have learned during their study of geology. You can use these sheets to record additional narrations, copywork, or dictation assignments.

Project Record Sheets

The purpose of these sheets is for the students to record the projects they have done during the course of their study of geology.

Geology Glossary

The purpose of the glossary is for the students to create a dictionary of terms that they have encountered while reading *The Sassafras Science Adventures Volume 5: Geology*. They can look up each term in a science encyclopedia or in the glossary included on pp. 139-140 of this guide. Then, have the students copy the definition onto a blank index card or into their SCIDAT logbooks. They should also illustrate each of the vocabulary words. (NOTE—In *The Official Sassafras Student SCIDAT Logbook: Geology Edition*, these pictures are already provided.)

VOCABULARY

Have the older students look up the following terms in the glossary in the appendix on pp. 139-140 or in a science encyclopedia. Then, have them copy the definition onto a blank index card or into their SCIDAT logbook.

📖 **GEOGRAPHY** – The branch of science that studies the earth's surface

📖 **GEOLOGY** – The branch of science that studies the rocks on the earth's crust.

(OPTIONAL) COPYWORK

Copywork Selection

"Never Eat Soggy Worms" stands for north, east, south, and west.

Dictation Passage

A compass can help you know which direction you are traveling. The compass rose is the figure on a compass, map, or nautical chart that you can use to determine your bearings. The four main directions on a compass rose are north, south, west, and east.

DO: PLAYING WITH SCIENCE

SCIENTIFIC DEMONSTRATION: OBSERVING YOUR BACKYARD

Begin by taking a moment to discuss the different types of biomes you have learned about so far in the Sassafras Science series (i.e., deserts, grasslands, forests, and so on). You can discuss the weather and typical plants found there and then identify which type of biome you live in. You can also discuss how important observation skills are for the scientist who is studying geology. You can view the following blog posts for more information on the subject of observation:

🔗 <http://elementalscience.com/blogs/news/63858627-observation-is-key>

🔗 <http://elementalscience.com/blogs/homeschool-science-tips/71117699-3-ways-to-work-on-observation>

Tell the students that they are going to practice their observation skills while finding and observing the soil and rocks you can find in your backyard. Then, take a walk in your backyard, in your neighborhood, or on a nearby nature trail. Allow the students to make observations and ask questions. Ask the students:

- ? Can you see any rocks?
- ? What do those rocks look like?
- ? What does the soil look like?

Allow the students to observe the environment and find clues from there. You can record their answers on the sheet provided in the SCIDAT logbook.

(OPTIONAL) STEAM PROJECTS

Multi-chapter Activities

- ✂️ **ROCK COLLECTION** – Over the weeks of this study, the students will collect and identify rocks for their own personal collections. You will need a large egg carton (one with 18 slots), a rock field guide, white-out correction fluid, and a Sharpie marker. Have them begin by numbering each of the cups from #1 through #18. Every week, each student will collect a new rock and paint a bit of white-out on each one. Then, they will write the sample number, i.e., #1, on each of the rocks. After that, you will help the students use the field guide(s) you have to identify the rocks they have collected. Once each student has identified their sample, have them record the name of the rock and several details about it on a separate sheet of paper. You can use the template found in the appendix on p. 133.

Activities For This Chapter

- ✂ I SPY – Play a game of “I Spy” to help the students work on their observation skills.
- ✂ COMPASS – Have the students make their own compass. You will need a straight pin, a milk jug, a knife, and a magnet. You can find the directions for this here:
 - 📄 <https://elementalscience.com/blogs/science-activities/how-to-make-a-compass>

CHAPTER 2: GRID SCHEDULE

Supplies Needed				
Demo	• Modeling clay (you will need yellow, orange, red, blue, and green), Ruler			
Projects	• Rock to identify, Rice Krispies, Marshmallows, Butter, Icing			
Chapter Summary				
<p>The chapter opens with the Man With No Eyebrows recalling his plan to kidnap the villains that the Sassafras Twins have encountered on their journey so far. We also find out that Tracey found the cameras he had hidden in Uncle Cecil’s basement lab. Elsewhere, Blaine and Tracey arrive at their first location in Ecuador, where a little girl is fighting over her bike with a bully named José. Just as Blaine and Tracey are about to step in, two superheroes sweep in and save the day. It turns out that one of the rescuers is their local expert, Jase Judson, and he shares about continents and the layers of the earth with the twins. Blaine and Tracey also find out that the two would-be superheroes are in Ecuador looking for the Hovering Shadow, which is said to have a hidden complex in a nearby volcano. The group heads back to the girl’s uncle’s duck boat shop where the girl, Alicia, tells her Uncle Arturo the story of what has happened. In the meantime, the Man With No Eyebrows uses the Dark Cape to kidnap Rona the Baker, take her back to his lab, and erase her memory. The chapter ends back at the duck boat shop, where Arturo confirms the belief that the Hovering Shadow lives in the vicinity of Mt. Cotapaxi, a nearby volcano.</p>				
Weekly Schedule				
	Day 1	Day 2	Day 3	Day 4
Read	<input type="checkbox"/> Read the section entitled “Crushing Continents” of Chapter 2 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> Read the section entitled “Leaping through Layers” of Chapter 2 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> (<i>Optional</i>) Read one or all of the assigned pages from the encyclopedia of your choice.	<input type="checkbox"/> (<i>Optional</i>) Read one of the additional library books.
Write	<input type="checkbox"/> Fill out a Geology Record Sheet on SL p. 9 on continents. <input type="checkbox"/> Add information on South America to the Continent Sheet on SL p. 7.	<input type="checkbox"/> Fill out a Geology Record Sheet on SL p. 10 on layers of the earth. <input type="checkbox"/> Label the surrounding bodies of water and/or land for South America on the Continent Map on SL p. 8.	<input type="checkbox"/> Write the information learned from the demonstration on SL p. 13. <input type="checkbox"/> (<i>Optional</i>) Write a narration on the Geology Notes Sheet on SL p. 13.	<input type="checkbox"/> Go over the vocabulary words and enter them into the Geology Glossary on SL p. 91. <input type="checkbox"/> (<i>Optional</i>) Do the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 13.
Do	<input type="checkbox"/> (<i>Optional</i>) Label the Continents.	<input type="checkbox"/> (<i>Optional</i>) Make an Edible Earth.	<input type="checkbox"/> Do the demonstration entitled “Model Earth.”	<input type="checkbox"/> (<i>Optional</i>) Add a rock to your Rock Collection.

CHAPTER 2: LIST SCHEDULE

CHAPTER SUMMARY

The chapter opens with the Man With No Eyebrows recalling his plan to kidnap the villains that the Sassafras Twins have encountered on their journey so far. We also find out that Tracey found the cameras he had hidden in Uncle Cecil's basement lab. Elsewhere, Blaine and Tracey arrive at their first location in Ecuador, where a little girl is fighting over her bike with a bully named José. Just as Blaine and Tracey are about to step in, two superheroes sweep in and save the day. It turns out that one of the rescuers is their local expert, Jase Judson, and he shares about continents and the layers of the earth with the twins. Blaine and Tracey also find out that the two would-be superheroes are in Ecuador looking for the Hovering Shadow, which is said to have a hidden complex in a nearby volcano. The group heads back to the girl's uncle's duck boat shop where the girl, Alicia, tells her Uncle Arturo the story of what has happened. In the meantime, the Man With No Eyebrows uses the Dark Cape to kidnap Rona the Baker, take her back to his lab, and erase her memory. The chapter ends back at the duck boat shop, where Arturo confirms the belief that the Hovering Shadow lives in the vicinity of Mt. Cotapaxi, a nearby volcano.

ESSENTIAL TO-DO'S

Read

- ☐ Read the section entitled "Crushing Continents" of Chapter 2 in *SSA Volume 5: Geology*.
- ☐ Read the section entitled "Leaping through Layers" of Chapter 2 in *SSA Volume 5: Geology*.

Write

- ☐ Fill out a Geology Record Sheet on SL p. 9 on continents.
- ☐ Add information on South America to the Continent Sheet on SL p. 7.
- ☐ Fill out a Geology Record Sheet on SL p. 10 on layers of the earth.
- ☐ Label the surrounding bodies of water and/or land for South America on the Continent Map on SL p. 8.
- ☐ Write the information learned from the demonstration on SL p. 13.
- ☐ Go over the vocabulary words and enter them into the Geology Glossary on SL p. 91.

Do

- ☐ Do the demonstration entitled "Model Earth."

OPTIONAL EXTRAS

Read

- ☐ Read one of the additional library books.
- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

- ☐ Write a narration on the Geology Notes Sheet on SL p. 13.
- ☐ Complete the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 13.

Do

- ☐ Label the Continents.
- ☐ Make an Edible Earth.
- ☐ Add a rock to your Rock Collection.

Supplies Needed	
Demo	• Modeling clay (you will need yellow, orange, red, blue, and green), Ruler
Projects	• Rock to identify, Rice Krispies, Marshmallows, Butter, Icing

CHAPTER 2: A SUPER SCIENTIFIC START

READ: GATHERING INFORMATION

LIVING BOOK SPINE

- 📖 Chapter 2 of *The Sassafras Science Adventures Volume 5: Geology*

(OPTIONAL) ENCYCLOPEDIA READINGS

- 📖 *Basher Science Planet Earth* pp. 10-11 (Core), pp. 12-13 (Mantle), pp. 14-15 (Crust), pp. 40-41 (Continents)
- 📖 *Usborne Children's Encyclopedia* pp. 290-291 (South America)
- 📖 *Discover Science Planet Earth* pp. 8-9 (Inside Earth)
- 📖 *Kingfisher Science Encyclopedia* pp. 8-9 (Earth's Structure)



(OPTIONAL) ADDITIONAL LIBRARY BOOKS

- 📖 *The Seven Continents (Rookie Read-About Geography)* by Will Mara
- 📖 *Continents in My World* by Ella Cane and Gail Saunders-Smith
- 📖 *Explore South America (Explore the Continents)* by Molly Aloian and Bobbie Kalman
- 📖 *Planet Earth/Inside Out* by Gail Gibbons
- 📖 *The Magic School Bus Inside the Earth (Magic School Bus)* by Joanna Cole and Bruce Degen
- 📖 *See Inside Planet Earth (Usborne Flap Book)* by Katie Daynes and Peter Allen

WRITE: KEEPING A NOTEBOOK

SCIDAT LOGBOOK SHEETS

This week, you can have the students begin to fill out the continent sheet for South America and begin to label the continent map for South America with the information from the chapter. They can also fill out the logbook sheets for continents and layers of the earth. Here is the information they could include:

Continent Map - South America

This week, have the students label the bordering bodies of water and land on the continent map. The students should label the following:

- Isthmus of Panama
- Pacific Ocean
- Atlantic Ocean
- Caribbean Sea
- Drake Passage



Continent Sheet - South America

SIZE AND LOCATION

- South America is the fourth largest continent.
- South America is in the western hemisphere.

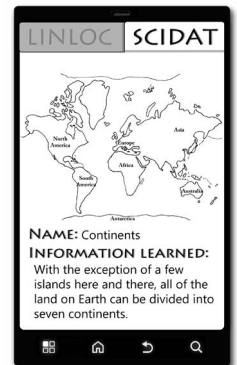
GEOLOGICAL FEATURES

- South America is separated from North America by the Isthmus of Panama.
- It is bordered by the Pacific Ocean on the west, the Atlantic Ocean on the East, and the Caribbean Sea to the North. To the south, is the Drake Passage and Antarctica.

Geology Record Sheet - Continents

INFORMATION LEARNED

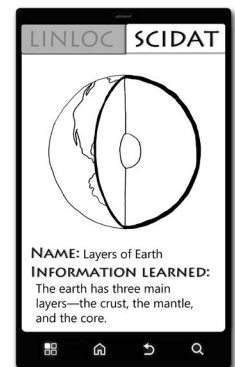
- With the exception of a few islands here and there, all the land on Earth can be divided into seven continents:
 1. North America
 2. South America
 3. Europe
 4. Asia
 5. Africa
 6. Australia
 7. Antarctica
- The shape of these continents can easily be seen from space. Some are surrounded completely by water, like Australia.
- Others touch each other, like Europe and Asia.
- Each continent is divided into smaller regions called countries.
- Some continents have lots of countries, while others only have a few.



Geology Record Sheet - Layers of the Earth

INFORMATION LEARNED

- The earth has three main layers:
 1. The crust
 2. The mantle
 3. The core
- The core of the earth is found at the center of the globe. It has two parts:
 1. The inner core, which is solid iron and is responsible for giving the earth its magnetic properties.
 2. The outer core, which is made of extremely hot liquid and molten rock.
- The next layer out is the mantle, which is the thickest layer of the earth. It is composed of extremely hot molten rock called magma.
- The top layer of the earth is the crust, which is the thinnest and most visible layer. It is thicker in some areas than in others, but basically it floats on top of the mantle layer. The crust is a layer of rock that makes up the ocean floor and the masses of land that make up the world's continents.
- The magma from the mantle can sometimes reach the surface at thin spots in the crust, called hot spots. At these places, you can typically find volcanoes and other geothermal features.



VOCABULARY

Have the older students look up the following terms in the glossary in the appendix on pp. 139-140 or in a science encyclopedia. Then, have them copy the definition onto a blank index card or into their SCIDAT logbooks.

📖 **CONTINENT** – A large area of land on Earth.

📖 **MAGMA** – Molten rock found under earth's surface.

(OPTIONAL) COPYWORK

Copywork Sentence

The three layers of the earth are the crust, the mantle, and the core.

Dictation Selection

The Seven Continents (Author unknown, from the At Youth Safety website)

North America, South America joined in the West.

Europe and Asia meet together, and on Africa they rest.

Australia stands alone, floating down below.

And Antarctica is the loneliest because no one wants to go.

DO: PLAYING WITH SCIENCE

SCIENTIFIC DEMONSTRATION: MODEL EARTH

Materials

- ☑ Modeling clay (you will need yellow, orange, red, blue, and green)
- ☑ Ruler

Procedure

1. Have the students begin by making a ball about 1.2 cm across out of the yellow clay. This represents the earth's inner core.
2. Then, have them make another layer about 3 cm across out of the red clay around the ball. This layer represents the earth's outer core.
3. After that, have them add another layer about 6 cm across out of the orange clay around the ball. This layer represents the earth's mantle.
4. Next, have the students make several flattened pieces of blue and green clay to represent the earth's crust and layer those pieces over the ball.
5. Finally, have the students cut the ball in half to observe the different layers of their model.

Explanation

The students should see the different layers in their model just as if we were to cut the earth in half to peek inside!

Take It Further

Have the students make a paper mache model of the earth. Directions for this can be found here:

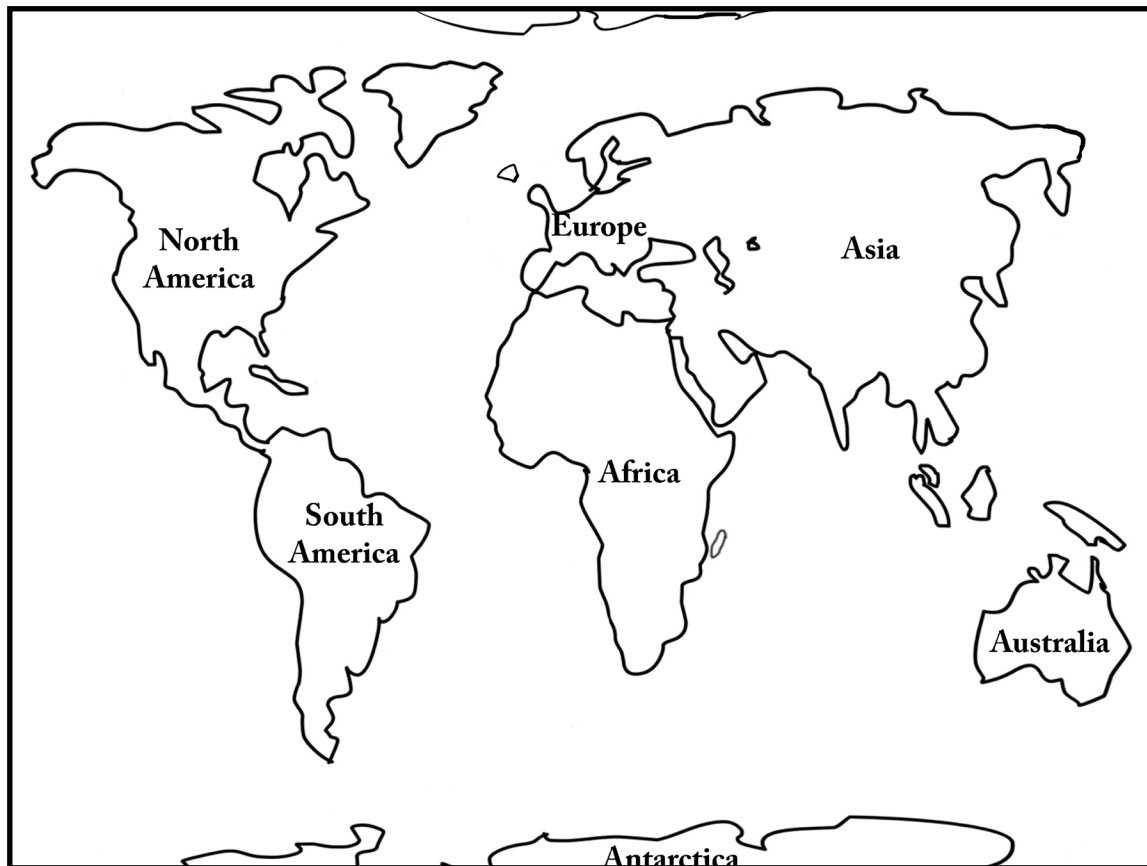
🔗 <https://www.weirdunsocializedhomeschoolers.com/step-by-step-making-paper-mache-earth/>

(OPTIONAL) STEAM PROJECTS

Multi-chapter Activities

- ✂ **ROCK COLLECTION** – Over the weeks of this study, the students will be collecting and identifying rocks for their own personal collections. This week, have the students each collect a new rock and paint a bit of white-out on it. Then, they will write the sample number #2 on the rock. After that, use the field guide(s) you have to identify the rocks they collected. Once the students have identified their samples, have each student record the name of their rock and several details about it on a separate sheet of paper. You can use the template found in the appendix on p. 133.

Activities For This Chapter



- ✂ **CONTINENTS** – Have the students label and color the continents (North America, South America, Europe, Asia, Africa, Australia, and Antarctica) on a map of the earth. You can use the map template provided in the appendix on p. 136. After you do that, memorize the continents with the help of the following song:
 - 📎 The Continent Song - <https://www.youtube.com/watch?v=fqsCWZtZlk4>
- ✂ **EDIBLE EARTH** – Make an edible earth core with the students using Rice Krispie treats and icing. See the following website for directions:
 - 📎 <http://teachbesideme.com/geography-earths-core-project/>

CHAPTER 3: GRID SCHEDULE

Supplies Needed				
Demo	• Aluminum pan, Empty soda bottle with a small opening, Air-dry clay or salt dough, Baking soda, Liquid dish soap, Red and yellow food coloring, White vinegar			
Projects	• Rock to identify, Paper cup, Crackers (saltines or Ritz™), Can of CheeseWhiz™			
Chapter Summary				
<p>The chapter opens with José, the bully, returning to get Alicia’s bicycle with the help of his two much larger cousins, Andrés and Leoncio. A fight ensues and Brick Kid, a.k.a. Jase Judson, saves the day. Before the bullies wake up, Alicia, Arturo, Blaine, Tracey, Andy, and Jase quickly set out for Mt. Cotopaxi in a duck boat. On the way, Jase shares about volcanoes with the group. When they arrive, the group fans out in search of signs of the Hovering Shadow’s hidden den. Blaine slips along the path and is separated from Tracey. Meanwhile, the Man With No Eyebrows heads off to Canada. Back at the volcano, Blaine finds a hidden door that opens into a tunnel. As he turns to find the rest of the group, he sees that Mt. Cotopaxi has begun to spew out ash. Tracey spots Blaine from higher up on the trail and then notices a dark hovering mass approaching him. As the Hovering Shadow reaches for Blaine, Brick Kid comes out of nowhere and once again saves the day. The group manages to all make it back to the duck boat. They race through the terrain covered with geothermal features, and Jase shares a bit more about them. The chapter ends with the Hovering Shadow reaching the group in the duck boat.</p>				
Weekly Schedule				
	Day 1	Day 2	Day 3	Day 4
Read	<input type="checkbox"/> Read the section entitled “Vanishing Volcanoes” of Chapter 3 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> Read the section entitled “Gushing Geysers” of Chapter 3 in <i>SSA Volume 5: Geology</i> .	<input type="checkbox"/> (<i>Optional</i>) Read one or all of the assigned pages from the encyclopedia of your choice.	<input type="checkbox"/> (<i>Optional</i>) Read one of the additional library books.
Write	<input type="checkbox"/> Fill out a Geology Record Sheet on SL p. 11 on volcanoes. <input type="checkbox"/> Add information on South America to the Continent Sheet on SL p. 7.	<input type="checkbox"/> Fill out a Geology Record Sheet on SL p. 12 on geothermal features. <input type="checkbox"/> Label the major geographical features found in South America on the Continent Map on SL p. 8.	<input type="checkbox"/> Write the information learned from the demonstration on SL p. 14. <input type="checkbox"/> (<i>Optional</i>) Write a narration on the Geology Notes Sheet on SL p. 14.	<input type="checkbox"/> Go over the vocabulary words and enter them into the Geology Glossary on SL p. 92. <input type="checkbox"/> (<i>Optional</i>) Complete the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 14. <input type="checkbox"/> (<i>Optional</i>) Take Geology Quiz #1.
Do	<input type="checkbox"/> (<i>Optional</i>) Make an Edible Volcano.	<input type="checkbox"/> (<i>Optional</i>) Complete the Alka Seltzer Geyser activity.	<input type="checkbox"/> Do the demonstration entitled “Volcanic Explosion.”	<input type="checkbox"/> (<i>Optional</i>) Add a rock to your Rock Collection.

CHAPTER 3: LIST SCHEDULE

CHAPTER SUMMARY

The chapter opens with José, the bully, returning to get Alicia's bicycle with the help of his two much larger cousins, Andrés and Leoncio. A fight ensues and Brick Kid, a.k.a. Jase Judson, saves the day. Before the bullies wake up, Alicia, Arturo, Blaine, Tracey, Andy, and Jase quickly set out for Mt. Cotopaxi in a duck boat. On the way, Jase shares about volcanoes with the group. When they arrive, the group fans out in search of signs of the Hovering Shadow's hidden den. Blaine slips along the path and is separated from Tracey. Meanwhile, the Man With No Eyebrows heads off to Canada. Back at the volcano, Blaine finds a hidden door that opens into a tunnel. As he turns to find the rest of the group, he sees that Mt. Cotopaxi has begun to spew out ash. Tracey spots Blaine from higher up on the trail and then notices a dark hovering mass approaching him. As the Hovering Shadow reaches for Blaine, Brick Kid comes out of nowhere and once again saves the day. The group manages to all make it back to the duck boat. They race through the terrain covered with geothermal features, and Jase shares a bit more about them. The chapter ends with the Hovering Shadow reaching the group in the duck boat.

ESSENTIAL TO-DO'S

Read

- ☐ Read the section entitled "Vanishing Volcanoes" of Chapter 3 in *SSA Volume 5: Geology*.
- ☐ Read the section entitled "Gushing Geysers" of Chapter 3 in *SSA Volume 5: Geology*.

Write

- ☐ Fill out a Geology Record Sheet on SL p. 11 on volcanoes.
- ☐ Add information on South America to the Continent Sheet on SL p. 7.
- ☐ Fill out a Geology Record Sheet on SL p. 12 on geothermal features.
- ☐ Label the major geographical features found in South America on the Continent Map on SL p. 8.
- ☐ Write the information learned from the demonstration on SL p. 14.
- ☐ Go over the vocabulary words and enter them into the Geology Glossary on SL p. 92.

Do

- ☐ Do the demonstration entitled "Volcanic Explosion."

OPTIONAL EXTRAS

Read

- ☐ Read one of the additional library books.
- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

- ☐ Write a narration on the Geology Notes Sheet on SL p. 14.
- ☐ Complete the copywork or dictation assignment and add it to the Geology Notes sheet on SL p. 14.
- ☐ Take Geology Quiz #1.

Do

- ☐ Make an Edible Volcano.
- ☐ Complete the Alka Seltzer Geyser activity.
- ☐ Add a rock to your Rock Collection.

Supplies Needed	
Demo	<ul style="list-style-type: none">Aluminum pan, Empty soda bottle with a small opening, Air-dry clay or salt dough, Baking soda, Liquid dish soap, Red and yellow food coloring, White vinegar
Projects	<ul style="list-style-type: none">Rock to identify, Paper cup, Crackers (saltines or Ritz™), Can of CheeseWhiz™

CHAPTER 3: AN ELEVATING ESCAPE TO ECUADOR

READ: GATHERING INFORMATION

LIVING BOOK SPINE

📖 Chapter 3 of *The Sassafras Science Adventures Volume 5: Geology*

(OPTIONAL) ENCYCLOPEDIA READINGS

- 📖 *Basher Science Planet Earth* pp. 22-23 (Volcano)
- 📖 *Usborne Children's Encyclopedia* pp. 22-23 (Volcanoes)
- 📖 *Discover Science Planet Earth* pp. 22-23 (Volcanoes)
- 📖 *Kingfisher Science Encyclopedia* pp. 18-19 (Volcanoes)

(OPTIONAL) ADDITIONAL LIBRARY BOOKS

- 📖 *National Geographic Readers: Volcanoes* by Anne Schreiber
- 📖 *Volcanoes (Let's-Read-and-Find... Science 2)* by Franklyn M. Branley and Megan Lloyd
- 📖 *The Magic School Bus Blows Its Top: A Book About Volcanoes* by Gail Herman and Bob Ostrom
- 📖 *Geysers (True Books: Earth Science)* by Larry Dane Brimner
- 📖 *Geysers: What They Are and How They Work* by Scott T. Bryan



WRITE: KEEPING A NOTEBOOK

SCIDAT LOGBOOK SHEETS

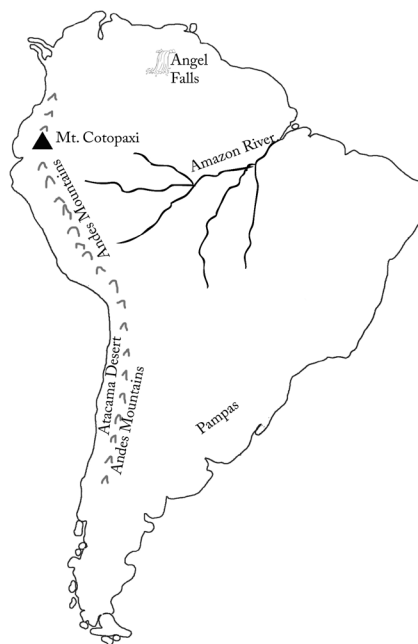
This week, you can have the students finish filling out the continent sheet for South America and finish labeling the continent map for South America with the information from the chapter. They can also fill out the logbook sheets for volcanoes and geothermal features. Here is the information they could include:

Continent Map - South America

This week, have the students label the major geological features found in South America on the continent map.

The students should label the following:

- Mt. Cotopaxi
- Pampas
- Andes Mountains
- Atacama Desert
- Amazon River
- Angel Falls



Continent Sheet - South America

REGIONS

- South America can be separated into three regions:
 1. Mountains and highlands
 2. River basins
 3. Coastal plains

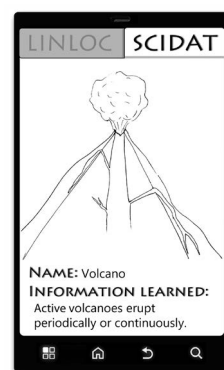
GEOLOGICAL FEATURES

- South America is home to the Amazon River, which is the longest river in the world.
- South America is home to Angel Falls, which is the highest waterfall in the world.
- South America is home to the Atacama Desert, which is the driest desert in the world.
- South America is home to Mt. Cotapaxi, which is the highest volcano on the earth.
- Other major geographical features include the Andes Mountains and the Pampas.

Geology Record Sheet - Volcanoes

INFORMATION LEARNED

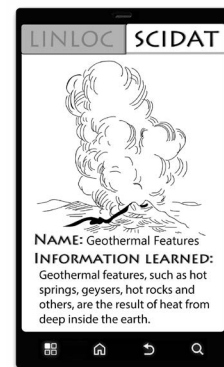
- Volcanoes are mountains that have been made from molten rock and lava.
- Underneath the volcanic mountains, magma collects in a chamber. When the pressure in the chamber becomes too high, the molten rock is forced upward through a vent, and the volcano erupts.
- Volcanoes can be active, dormant, or extinct. Active would mean that they erupt periodically or continuously. Dormant means they have been known to erupt in modern times. Extinct means they have not erupted in modern times.
- Volcanic eruptions can include molten rock (also called lava), hot gases, and ash. The lava from the eruption will eventually cool and form another layer on the surface of the volcano.
- There are three basic shapes, based on how and what they erupt.
 4. Cinder cone volcanoes are shaped like flat domes. They typically erupt explosively with hot ash and lava.
 5. Shield volcanoes have a gently sloping appearance. The lava typically oozes or flows out onto the surface.
 6. Composite volcanoes have steep domes. They can have both quiet, slow-moving eruptions and explosive eruptions, which leads to the composite appearance.



Geology Record Sheet - Geothermal Features

INFORMATION LEARNED


- Geothermal features are features found on the earth's surface, like hot springs, geysers, and hot rocks, that result from heat inside the earth.
- These features occur at hotspots in the earth's crust, usually near volcanoes.
- Hot springs are formed from groundwater that has been heated up by hot surface rock, and it bubbles up to the surface to form a pool. These springs are typically rich in minerals that have been dissolved from the surrounding rock.
- Geysers are jets of hot water and steam that shoot into the air. This occurs when groundwater is heated up and trapped in a network of cracks. Eventually, the pressure builds up until the water forces its way out, forming its way out forming a geyser.




- The features can also occur under the ocean, in the seabed, in places known as hydrothermal vents.
- Yellowstone National Park has the largest collection of geothermal features in one place, but hot springs and geysers can be found around the world.

VOCABULARY

Have the older students look up the following terms in the glossary in the appendix on pp. 139-140 or in a science encyclopedia. Then, have them copy the definition onto a blank index card or into their SCIDAT logbooks.

 **GEOTHERMAL FEATURE** – A feature that is related to or produced by the internal heat of the earth.

 **LAVA** – Molten rock found on the earth's surface.

(OPTIONAL) COPYWORK

Copywork Sentence

Volcanoes can be active, dormant, or extinct.

Dictation Selection

Volcanoes can be active, dormant, or extinct. Active volcanoes can erupt periodically or continuously. Dormant volcanoes have been known to erupt in modern times, but not in recent years. Extinct volcanoes have not erupted in modern recorded history.

(OPTIONAL) QUIZ

This week, you can give the students a quiz based on what they learned in chapters 2 and 3. You can find the quiz in the appendix on p. 149.

Quiz #1 Answers

1. Large, Land
2. C,B,A
3. True
4. Active
5. Hotspots
6. Amazon River
7. See the labeled map on p. 35 for the answer.

Do: PLAYING WITH SCIENCE

SCIENTIFIC DEMONSTRATION: VOLCANIC EXPLOSION

Materials

- ☒ Aluminum pan
- ☒ Empty soda bottle with a small opening
- ☒ Air-dry clay or salt dough
- ☒ Baking soda, Liquid dish soap
- ☒ Red and yellow food coloring, White vinegar

Procedure

1. Have the students begin by placing the soda bottle at the center of the aluminum pan.
2. Then, have them mold the clay or salt dough around the bottle in the shape of a volcano.
3. Once they are finished, set it aside to dry. This may take several hours or overnight, depending on how thick the clay is.
4. Next, have the students paint and decorate their volcano creations.
5. Once the paint dries, head outside or place the volcano in a location that you don't mind getting dirty, as the following part can be very messy.
6. Then, pour $\frac{1}{4}$ cup of baking soda into the bottle and add 2 Tbsp of liquid dish soap plus 4 drops of the red food coloring and 4 drops of yellow food coloring.
7. Finally, add about a $\frac{1}{2}$ cup of vinegar into the container, step back, and watch what happens.

Explanation

The students should see a small eruption from their model volcano. The vinegar and the baking soda react to form carbon dioxide gas. The gas bubbles are trapped by the soap and forced up and out of the soda bottle opening.

Take It Further

Have the students change the jar-opening size or the amount of baking soda and vinegar to see how that affects the volcanic eruption. See the following post for more ideas:

🔗 <https://elementalscience.com/blogs/science-activities/explode-volcano-at-home>

(OPTIONAL) STEAM PROJECTS

Multi-chapter Activities

- ✂ **ROCK COLLECTION** – Over the weeks of this study, the students will be collecting and identifying rocks for their own personal collections. This week, have the students each collect a new rock and paint a bit of white-out on it. Then, they will write the sample number #3 on the rock. After that, use the field guide(s) you have to identify the rocks they collected. Once the students have identified their samples, have each student record the name of their rock and several details about it on a separate sheet of paper. You can use the template found in the appendix on p. 133.

Activities For This Chapter

- ✂ **EDIBLE VOLCANO** – Have the students make an edible volcano. You will need a paper cup, crackers (saltines or Ritz™), and a can of CheeseWhiz™. Poke a hole in the bottom of the paper cup just large enough to insert the tip of the CheeseWhiz™ can. Then, crush up the crackers so that you have some fine dust and some larger pieces. Add the crushed crackers to the cup to create a two to three inch thick layer of “dirt and rock”. Now, push the tip of the CheeseWhiz™ can to let the “magma” flow. Observe what happens. (NOTE—The students should see that the cheese pushes the crushed crackers out of the way and erupts at the top of the layer.) Once your students are done observing, they can eat their volcanic creations.
- ✂ **ALKA SELTZER GEYSER** – Have the students watch a geyser in action. You will need a small water bottle with cap, a nail, 2 Alka Seltzer tablets, and water. Poke a hole in the cap of the water bottle using the nail. Fill the bottle two-thirds of the way full with the warm water and set the bottle in a sink or tub. Then, add two Alka Seltzer tablets and quickly screw the cap back on. Step back and watch the geyser erupt.

GEOLOGY QUIZ #1

CHAPTERS 2 AND 3

1. A continent is a (small / large) area of (land / water).

2. Match the layers of the earth with their description.

Crust _____

A. Is found at the center of the globe and has two parts.

Mantle _____

B. The thickest layer of the earth, which is composed of extremely hot molten rock called magma.

Core _____

C. The top layer, which is the thinnest and most visible layer.

3. **True or False:** There are volcanoes under the sea.

4. A volcano that erupts often is called an _____ volcano.

Busy

Active

Playful

Dormant



5. Geothermal features occur at _____ in the earth's crust.

6. What is the name of the world's longest river? (*Hint: The river is found in South America.*)

7. Color South America on the map below.

